Sept. 14, 1948. W. J. RUSSELL 2,449,511

CONTAINER FOR BOMBS

Filed Oct. 21, 1943 2 Sheets-Sheet 1

Fig. 1.

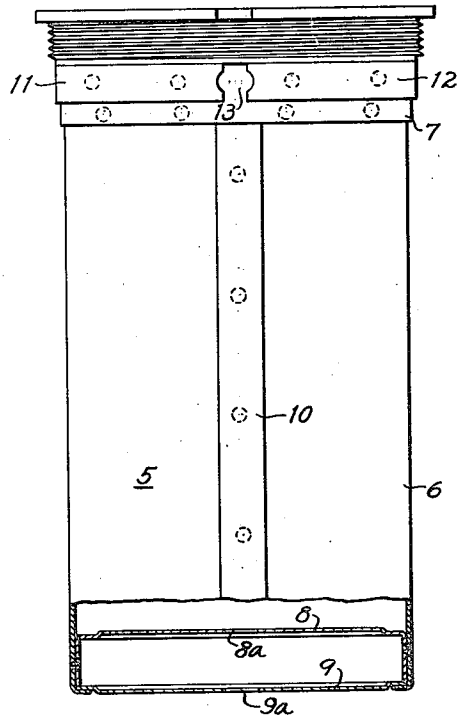


Fig. 5.

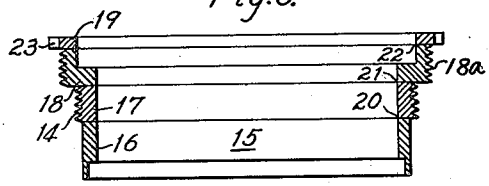
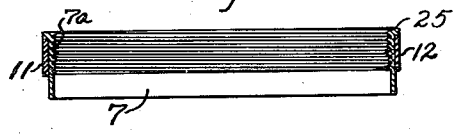


Fig. 6.



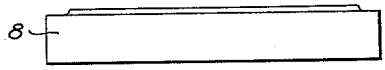


Fig. 2.



Fig. 3.

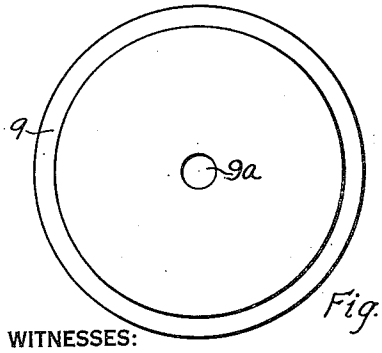
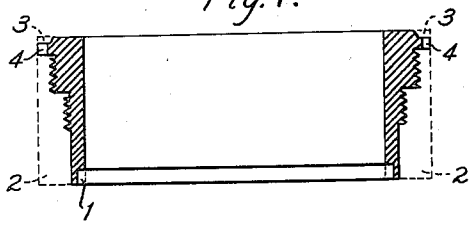


Fig. 4.

Fig. 7.



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Fig. 8.

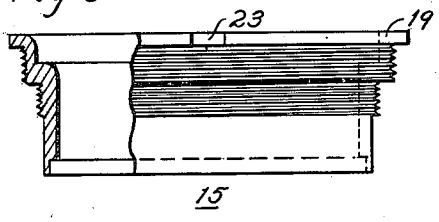


Fig. 9.

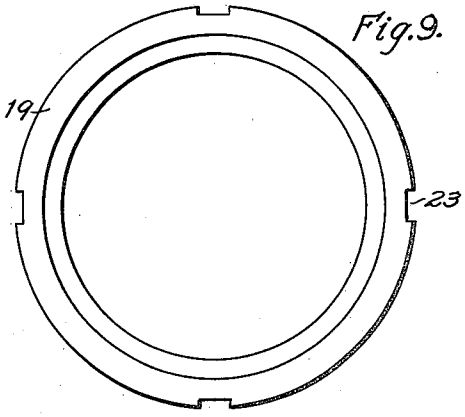


Fig. 10.

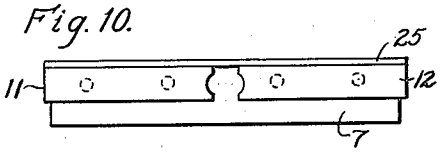


Fig. 11.

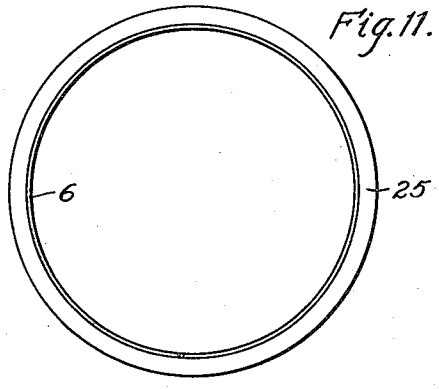


Fig. 12.

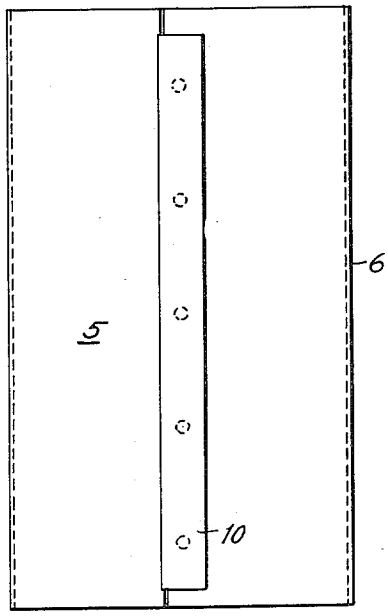
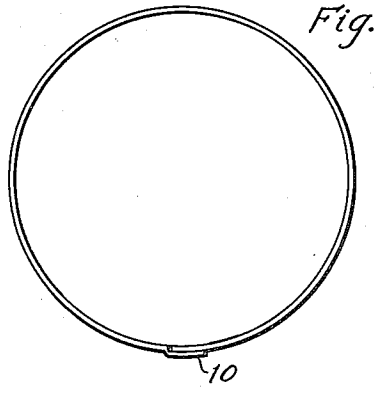


Fig. 13.



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CONTAINER FOR BOMBS

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Application October 21, 1943, Serial No. 507,190

6 Claims. (Cl. 102—70)

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My invention relates to projectiles, or bombs, and, more particularly, to containers for certain elements forming part of the particular type of projectile under consideration.

In bombs, or projectiles that are exploded photo-electrically, an amplifier container and a container for the batteries switch components, etc., have to be rigidly connected to each other. Since the elements are all destroyed when exploded and since the parts have to be rugged, it is extremely important to combine low cost with mechanism stability.

One object of my invention is to provide inexpensive containers for certain bomb or projectile elements.

Another object is the provision of inexpensive, rugged, and safer housings for the batteries, arming devices, and other parts of a projectile.

Other objects and advantages will become more apparent from the study of the following specification and the accompanying drawings, in which:

Figure 1 is a side view of parts of two containers in assembled relation, with parts broken away at the bottom of one container to more clearly show the construction;

Fig. 2 is a side view of the cup for receiving the tetryl;

Fig. 3 shows a side view of the cover for the showing in Fig. 2;

Fig. 4 is a bottom view of the subject matter shown in Fig. 3;

Fig. 5 is a longitudinal sectional view of the bottom portion of the container for the amplifier and some other elements;

Fig. 6 shows in section the top portion of the battery container;

Fig. 7 illustrates in section a construction suggested by prior art;

Figs. 8 and 9 are, respectively, elevation and plan views of a threaded bushing such as shown in Fig. 5 which is stamped or extruded from a single piece of material and then machined.

Fig. 10 is a detail showing a portion of the assembly of Fig. 1.

Fig. 11 is a plan view of the assembly of Fig. 1 with the threaded bushing removed, and

Figs. 12 and 13 are respectively elevation and plan views of the body portion of Fig. 1.

An electric proximity fuse, that is a fuse actuated by the proximity of the target, requires the use of a battery and arming switch. These units furnish the power and provide for safe fuse energization, and for safety and many othe reasons must be supported in a strong container. The

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prior art suggestions have been cast containers. A portion of this type of container is shown in Fig. 7. The blank from which this type of structure has to be made is indicated in dotted line. It will be noted that in regions 1, 2, 3, all the material has to be machined away and that wrench notches have to be cut at 4. These operations are extremely expensive.

Further the operation of fuses of this type depends upon a so-called powder train. Such a powder train by way of example may consist of a squib which is ignited by an electric filament placed in the arming switch. This squib discharges a second powder charge or cap of the powder train which is placed intermediate the squib and the final powder charge of the proximity fuse commonly known as tetryl. Combustion of the tetryl effected by the intermediate powder charge detonates the main powder charge of the bomb or shell.

In prior art devices, the tetryl charge is made a part of the assembly including the arming switch to form a complete operating unit. This was usually referred to as a combination arming and booster unit. This assembly, however, including the complete powder train is decidedly dangerous inasmuch as accidental discharge caused by careless handling with energy applied to the arming switch as is the case, since the assembly also includes energizing batteries, would cause the firing of first the squib, second the powder charge known as the cap and finally the tetryl charge. In the present invention such accidental discharge would involve only the squib and the cap since the tetryl charge is placed separately in a chamber made a part of the unit can, as hereinafter described. Thus the cap during assembly and handling of the arming mechanism is removed from the tetryl charge. Since the tetryl charge is by far the heaviest or largest of the three power train elements and consequently has a much more violent explosive reaction, the danger to personnel is measurably reduced. Upon assembly, the cap is disposed in proximity to the tetryl charge in the unit can and communicates therewith upon ignition through a hole in the tetryl chamber.

I have provided low cost, rugged housings which can be made dimensionally uniform in high production manufacture and can be made with existing manufacturing facilities.

The lower can, or container, 5 consists of four elements 6, 7, 8 and 9. The first element comprises a wrapper sheet 6 formed in the shape of a cylinder and having a flap 10 lapped, as

shown in Figs. 1 and 12. The lapped over portion is spot-welded for a rigid structure. To the upper end of this wrapper sheet 6, I spot-weld an attachment ring 7. This attachment ring 7 is threaded over a portion of its length internally (see Fig. 6). The unthreaded portion slips over the wrapper sheet and abuts the upper extremity of the flap 10. To this attachment ring I weld two semicircular segments 11 and 12 provided with diametrically disposed end constructions 13 for receiving a special wrench so that the can 5 may be secured on threads 14 of the threaded bushing 15 shown in Fig. 5. As previously noted, this threaded bushing forms the bottom portion of the amplifier housing. The remainder of the housing is not shown since it forms no part of this invention. This bushing functions to join the can 5 and the amplifier housing and in addition to secure the complete proximity fuse assembly in the nose of the bomb or shell by means of the threads 18a.

On the inside of the lower end of can 5, I position and spot-weld the bottom cup or tetryl chamber 8. This cup is so positioned that the lower end of the wrapper sheet 6 extends beyond the cup edge, thus providing a shoulder against which the cover plate 9 may be placed after the tetryl charge is positioned in the cup 8. This cover plate 9 is then retained in position by mechanically spinning over the lower edge of sheet 6 into the position shown in Fig. 1. Communication of the tetryl charge with the previously mentioned cap which ignites the tetryl is provided through the hole 8a in the cup 8. A similar hole 9a appears in the cover plate 9.

To avoid extensive machining I build up the threaded bushing 15 which forms the bottom of the above-mentioned amplifier housing from a plurality of standard and stock pipe sections 16, 17, 18, and 19. All that needs to be done with these sections is that they be brazed together or otherwise suitably joined at regions 20, 21, and 22.

Section 19 is merely provided with wrench receiving notches 23, section 18 machined slightly and threaded externally at 18a to threadedly engage the nose of a bomb, section 17 threaded externally at 14 to receive the threads 7a of the part 7, and section 16 machined slightly.

It is a reasonably inexpensive construction to make the attachment ring 12 of one part, that is, making the wrench receiving segments integral with the attachment ring. To further cheapen this construction, I propose the use of a thin pipe section such as 7, as shown in Fig. 6. This section 7 I provide with a spun-over portion 23 and internal threads 7a. To provide for a wrench receiving portion and to give strength to section 7, I spot-weld semicircular segments 11 and 12 to the section 7. Fig. 10 shows a side view of the construction shown in Fig. 6 and represents a detail elevation showing of this element appearing in the assembly of Fig. 1, whereas Fig. 11 shows a plan view with the wrapper sheet 6 in position. Figs. 12 and 13 show side and plan views respectively of the wrapper sheet 6.

Figs. 8 and 9, respectively, show fragmentary section and plan views of a modification for threaded bushing 15. This construction is the cheapest, the blank being of a single piece stamped or extruded from sheet steel. The surfaces are then machined slightly and the threads applied to form a useable structure.

I have thus provided a low cost construction, adaptable in part to sheet metal fabrication in punch presses and in part to assembly from easily obtained tubular sections. In short, the can is readily manufactured on machine tools ordinarily available in most any factory. Further, the special arrangement of elements 6, 8, and 9 removes the tetryl charge from the electrical equipment and other preliminary explosive charges as the squib and cap.

The foregoing description and the accompanying showing are merely illustrative of my invention. I, therefore, wish to be limited only by the scope of the claims hereto appended.

I claim as my invention:

1. An ordnance fuse container comprising in combination, a one-piece sleeve element of relatively thin sheet metal construction, said sleeve being generally in the shape of a right cylinder having a length greater than the diameter of the sleeve, the sleeve having a seam comprising a relatively narrow flap, of lesser length than the sleeve, disposed substantially symmetrically with reference to the mid-circumference of the sleeve and at right angles thereto, said flap being bent out of the surface of the sheet metal by an amount equal to the thickness of the sheet metal but being parallel to the sleeve contour whereby the inner surfaces of the abutting edges of the one-piece element fall in the same internal contour to thus provide the sleeve with a smooth inner surface over the entire length of the sleeve, the overlap formed by the flap being spot-welded to the underlying sheet metal, an inverted cup-like member having a relatively small central opening fitting snugly into the bottom of the cylindrical member and being spot-welded into position so that a small bottom strip of uniform axial width of the cylindrical member projects beyond the edge of the cup-like member, a disk-like cover having a relatively small axial opening disposed into the cylindrical member to fit against the edge of the cup-like member, the said small bottom strip being spun inwardly to hold the disk-like cover on the cup edge, an internally threaded ring having a smooth flange extending in the axial direction and fitting snugly over the upper end of the cylindrical member for an axial distance sufficient to contact the adjacent end of said flap, said flange being spot-welded to the top of the cylindrical member, an externally threaded ring screwed onto the first-named ring, a smooth ring having a downwardly directed shoulder brazed in concentric relation to the bottom of the externally threaded ring, a second externally threaded ring having an upwardly directed shoulder brazed in concentric relation to the first externally threaded ring and having a greater external diameter than the first externally threaded ring, a wrench receiving ring brazed in concentric relation to the top of the second externally threaded ring.

2. An ordnance fuse container comprising in combination, a cylindrical sleeve of a one-piece element of relatively thin sheet metal construction, said sleeve being generally in the shape of a right cylinder and having a seam comprising a relatively narrow flap, of lesser length than the sleeve, disposed substantially symmetrically with reference to the mid-circumference of the sleeve and at right angles thereto, said flap being bent out of the surface of the sheet metal by an amount equal to the thickness of the sheet metal but being parallel to the sleeve contour, whereby the inner surfaces of the abutting edges of the one-piece element fall in the same internal contour to thus provide the sleeve with a smooth inner surface over the entire length of the sleeve,

the lap provided by said flap being rigidly secured to the underlying sheet metal by a plurality of spot welds, an inverted cup-like member having a relatively small axial opening fitting into the bottom of the cylindrical member and being secured into place, by a plurality of spot welds, in such a position that a small bottom strip of uniform axial width of the cylindrical member projects beyond the cup edge, the cup edge thus forming a downwardly directed shoulder, a covering disk having a relatively small central opening disposed into the cylindrical member to fit against the cup edge, the said small bottom strip being bent inwardly against the cover to hold it in place, an internally threaded ring having a smooth axially directed flange fitting over the top of the cylindrical member and held in place by a plurality of spot welds, a pair of arcuate segments each somewhat less in circumferential length than the outer circumference of the internally threaded ring spot welded to the internally threaded ring below the upper edge of said ring.

3. An ordnance fuse container comprising in combination, a cylindrical sleeve of a one-piece element of relatively thin sheet metal construction, said sleeve being generally in the shape of a right cylinder and having a seam comprising a relatively narrow flap, of lesser length than the sleeve, disposed substantially symmetrically with reference to the mid-circumference of the sleeve and at right angles thereto, said flap being bent out of the surface of the sheet metal by an amount equal to the thickness of the sheet metal but being parallel to the sleeve contour, whereby the inner surfaces of the abutting edges of the one-piece element fall in the same internal contour to thus provide the sleeve with a smooth inner surface over the entire length of the sleeve, the lap provided by said flap being rigidly secured to the underlying sheet metal by a plurality of spot welds, an inverted cup-like member having a relatively small axial opening fitting into the bottom of the cylindrical member and being secured into place, by a plurality of spot welds, in such a position that a small bottom strip of uniform axial width of the cylindrical member projects beyond the cup edge, the cup edge thus forming a downwardly directed shoulder, a covering disk having a relatively small central opening disposed into the cylindrical member to fit against the cup edge, the said small bottom strip being bent inwardly against

the cover to hold it in place, an internally threaded ring having a smooth axially directed flange fitting over the top of the cylindrical member and held in place by a plurality of spot welds, a pair of arcuate segments each somewhat less in circumferential length than the outer circumference of the internally threaded ring spot welded to the internally threaded ring below the upper edge of said ring, a solid annulus having a downwardly directed flange extending into the top of the cylindrical member and having a portion provided with external threads engaging the threads of the internally threaded ring, said solid ring having a portion of greater external diameter above its first external threads also provided with external threads, and a radially outwardly directed flange on top of the portion of greater external diameter provided with wrench receiving notches.

4. The subject matter of claim 3 wherein the downwardly directed flange is provided with a downwardly directed shoulder and the portion having the greater external diameter is L-shaped in section with the horizontal portion thereof having substantially the circumferential dimensions of the first externally threaded portion of the solid annulus.

5. The subject matter of claim 3 wherein the solid annulus comprises a piece of standard piping stamped into shape so that the flange has a downwardly directed shoulder and the second externally threaded portion is L-shaped in section with the internal diameter of the horizontal portion having the same internal diameter as the first externally threaded portion.

6. The subject matter of claim 3 wherein the solid annulus is built up into a unitary structure by brazing from individual pipe sections.

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